

556014

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number
WO 2004/101755 A2

(51) International Patent Classification⁷:**C12N**

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:

PCT/US2004/014489

(22) International Filing Date: 7 May 2004 (07.05.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/468,608

7 May 2003 (07.05.2003) US

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

— without international search report and to be republished upon receipt of that report

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/101755 A2

(54) Title: REF1 MODIFIED PLANTS AND PLANT SEEDS

(57) Abstract: The present invention relates to plant cell wall synthesis, and to the synthesis of soluble compounds in plants commonly known as secondary metabolites or natural products. In particular, the present invention provides plant aldehyde dehydrogenases with a novel capacity of oxidizing hydroxycinnamaldehydes to hydroxycinnamic acids, and genes encoding the enzyme, as well as variants of the gene, and methods of using the genes and variants of the gene to modify plant chemistry. The methods of the present invention include reducing sinapine content of a seed, decreasing hydroxycinnamic acid content in a plant cell, and modifying lignin property in a plant cell wall by manipulating the activity of the novel plant aldehyde dehydrogenase in a plant cell.